

Application No. 10/737,222

AMENDMENT TO THE CLAIMS

Please replace the pending claims with the following amended claims:

Claims 1 – 6 (Cancelled)

7. (Currently Amended) A biaxial piezoelectric motor comprising The biaxial piezoelectric motor of claim 6;

a contact element, the contact element to include at least one point to contact an object to be moved;

a first piezoelectric driver coupled to one side of the contact element, when energized, the first piezoelectric driver to move the object in a first direction approximately tangential to the surface of the contact element at the at least one point of contact; and,

a second piezoelectric driver coupled to a second side of the contact element, the piezoelectric to move the object in a second direction approximately tangential to the surface of the contact element at the at least one point of contact, the first direction and the second direction to form an angle other than 180 degrees to enable movement of the object in a two dimensional plane

drive circuitry coupled to the first piezoelectric driver and the second piezoelectric driver, the drive circuitry to determine a desired direction and amplitude of motion for the object wherein the amplitude of motion for the object is controlled by adjusting the frequency of the first piezoelectric with respect to the frequency of the second piezoelectric, a higher frequency representing an increase in amplitude of motion for the object, the drive circuitry including a processor that computes the voltage amplitude applied to the first piezoelectric and the voltage amplitude applied to the second piezoelectric to move the object in the desired direction.

Claim 8 (Cancelled)

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9. (Currently Amended) A biaxial piezoelectric motor comprising the biaxial piezoelectric motor of claim 8;

a contact element, the contact element to include at least one point to contact an object to be moved;

a first piezoelectric driver coupled to one side of the contact element, when energized, the first piezoelectric driver to move the object in a first direction approximately tangential to the surface of the contact element at the at least one point of contact; and,

a second piezoelectric driver coupled to a second side of the contact element, the piezoelectric to move the object in a second direction approximately tangential to the surface of the contact element at the at least one point of contact, the first direction and the second direction to form an angle other than 180 degrees to enable movement of the object in a two dimensional plane;

drive circuitry coupled to the first piezoelectric driver and the second piezoelectric driver, the drive circuitry to determine a desired direction and amplitude of motion for the object, the drive circuitry including a processor that computes the voltage amplitude applied to the first piezoelectric and the voltage amplitude applied to the second piezoelectric wherein the ratio of voltage amplitude applied to the first piezoelectric driver to the voltage amplitude applied to the second piezoelectric driver is equal to the ratio of the cosine of the angle formed between the desired direction and the first direction and the cosine of the angle between the desired direction and the second direction to move the object in the desired direction and wherein the ratio of amplitude of motion for the object is a ratio of frequency applied to the first piezoelectric driver to the frequency applied to the second piezoelectric driver.

Claims 10 - 14 (Cancelled)

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15. (Currently Amended) A biaxial piezoelectric motor comprising the biaxial piezoelectric motor of claim 13;

a contact element, the contact element to include at least one point to contact an object to be moved, wherein the contact element interacts with an opposite surface to increase friction on the object to be moved and wherein the opposite surface is a ball bearing;.

a first piezoelectric driver coupled to one side of the contact element, when energized, the first piezoelectric driver to move the object in a first direction approximately tangential to the surface of the contact element at the at least one point of contact; and,

a second piezoelectric driver coupled to a second side of the contact element, the piezoelectric to move the object in a second direction approximately tangential to the surface of the contact element at the at least one point of contact, the first direction and the second direction to form an angle other than 180 degrees to enable movement of the object in a two dimensional plane.

Claims 16 – 25 (Cancelled)

26. (Previously Presented) A biaxial piezoelectric motor comprising:

a transfer element;

a first contact element driven by a first piezoelectric, the contact element coupled to a first point on the transfer element to move the transfer element in a first direction;

a second contact element driven by a second piezoelectric, the second contact coupled to a second point on the transfer element to move the transfer element in a second direction; and,

the transfer element including a surface to couple to an object to be moved, the transfer element to move the object in at least three degrees of freedom in

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a plane approximately tangential to the surface of the transfer element where the transfer element contacts the object to be moved.

27. (Original) The biaxial piezoelectric motor of claim 26 wherein the transfer element is spherical.

Claims 28 - 40 (Cancelled)